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Agriculture, land and desertification*

Report of the Secretary-General

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* The present report was prepared by the Food and Agriculture Organization of the United Nations as task manager for chapters 10 and 14, and the United Nations Environment Programme as task manager for chapter 12, of Agenda 21, with contributions from other United Nations agencies and international organizations and major groups. The report is a brief factual overview, which is intended to inform the Commission on Sustainable Development on key developments in the subject area.

Introduction

1. The present report highlights major trends and emerging issues affecting the thematic cluster of integrated planning and management of land resources, desertification and drought, and sustainable agriculture and rural development, dealt with in chapters 10, 12 and 14, respectively, of Agenda 21.[1] It presents a brief review of developments in these areas since the United Nations Conference on Environment and Development and assesses the opportunities for further actions in support of the goals contained in those chapters of Agenda 21, as well as related agreements.

2. While there has been progress globally in increasing food production and in understanding and implementing better natural resources management since the United Nations Conference on Environment and Development, problems of food security, poverty and land degradation still remain. The extraordinary combination of greater world food supply and lower prices that continued through the 1990s appeared to allay the fears of previous decades of rising population rates and imminent famine in Asia and elsewhere. Nevertheless, it is estimated that, at the close of the twenty-first century, more than 820 million people in the world remain undernourished, including 790 million living in developing countries and a further 34 million living in industrialized countries and countries with economies in transition.[2]

3. The problems of hunger and poverty are inextricably linked and one cannot be solved without tackling the other. While the total number of people living in poverty, based on an international poverty line of US$ 1 per day, is estimated to have fallen slightly in the 1990s, the figure still amounts to about 1.2 billion people.[3] In recognition of the critical importance of these issues, world leaders at the World Food Summit in 1996 agreed to a minimum target of halving the number of undernourished people in the world by 2015. This goal was reiterated by the Millennium Summit of the United Nations in September 2000, where Governments further committed themselves to reducing by half the number of the poor, also by the year 2015.[4]

4. The degradation of land resources is a global phenomenon. It is estimated that worldwide soil degradation affects over 2 billion hectares, putting at risk the livelihoods of more than 1 billion people. About two fifths of the land surface are drylands, with limited freshwater supplies, and a large proportion of this is considered degraded to some extent. About 65 per cent of all arable land may have already lost some biological and physical functions. The United Nations Environment Programme (UNEP) estimates that desertification (which occurs in arid, semi-arid and dry sub-humid areas) costs the world approximately US$ 42 billion a year.[5] It is in response to these problems and their global impact that 174 countries have ratified the United Nations Convention to Combat Desertification in Countries Experiencing Serious Drought and/or Desertification, particularly in Africa,[6] which also addresses related land degradation issues in an integrated manner.

5. About 75 per cent of the poor live in rural areas. Despite increasing urban poverty, projections are that a majority of the poor would continue to live in rural areas well into the twenty-first century.[7] Therefore efforts to combat persistent hunger and poverty, especially in sub-Saharan Africa, where nutrition and income levels have actually declined over the last decade, and in South and East Asia, where the largest number of the poor live, must address the rural areas and, in particular, agriculture and land issues. The challenge is to alleviate poverty and achieve food security while ensuring the sustainable use and management of land and other natural resources. The concept of sustainable agriculture and rural development (SARD), which has as its major objective to increase food security in an environmentally sound way so as to contribute to sustainable natural resource management, offers an approach to achieve this.[8]

I. Global issues affecting agriculture and land use

6. Both the global production of cereals and global cereal crop yields rose over the 10 years from 1986-1988 to 1996-1998. The largest gains were in developing countries. However, average per capita cereal production for the world remained stagnant over the period and actually fell in Africa and the Middle East regions, where population growth was the highest.[9] The continued growth in the global population until at least 2050 will require further increases in agricultural production, without placing soils, water and the environment in peril. According to the Food and Agriculture Organization of the United Nations (FAO), the process of globalization, which

accelerated during the 1990s, has already had a fundamental impact on agricultural production and use of resources. In many countries, the development of local and global competitive markets has stimulated enterprise changes and innovation in agricultural and land management practices, contributing to greater world food supply, increased responsiveness to changing patterns of consumer demand and lower real prices; but other countries have not effectively adjusted policies and programmes to benefit from new market situations. Moreover, the reduction of global food prices by about 10 per cent over the last decade, while welcome in many urban markets, can undermine the economies of small-scale agriculture in many developed and developing countries.

7. As trade barriers have been reduced, many agricultural producers in Africa, Asia and Latin America are facing increasing competition from neighbouring countries and industrialized country producers, while at the same time trying to cope with declining support services and the loss of subsidies owing to structural adjustment and liberalization policies. However, improvements in transport and marketing systems in many areas, in conjunction with economic growth and urbanization, are increasing market demand for products with added value through transformation and processing. The rural poor and small farmers have clearly benefited the least from globalization, while changes and innovations resulting from new policies and programmes have mostly benefited larger enterprises, especially vertically integrated firms with global reach.

8. Vertical integration in food systems from producer to consumer has accelerated, the major impact being on the livestock subsectors. In some areas, farmers' groups have responded effectively by creating cooperatives and larger-scale business arrangements for the production and marketing of agricultural goods for the global marketplace. Another trend that has intensified in the 1990s is the consolidation of large-scale agribusiness. Although investment levels in biotechnology industries appear to have declined in the current period, businesses dealing in agricultural inputs, grain trading, processing, machines and technologies tend to be concentrated in a fewer number of firms with a global spread. These large private enterprises can have profound effects on agriculture and land use. The initiatives of civil society, local business and Governments can act as a necessary balance to ensure that the interests of small-scale agricultural users are protected.

9. Examples of successful natural resources management include the use of sustainable agricultural technologies, such as the adoption of reduced tillage on nearly 60 million hectares in diverse countries and the instruction of 670,000 farmers in Asia in integrated pest management (IPM) techniques. The value of land resources as a carbon sink is currently being recognized in the context of the negotiations of the Kyoto Protocol[10] to the United Nations Framework Convention on Climate Change,[11] and the importance of genetic resources in agriculture is given growing attention in the implementation of the Convention on Biological Diversity.[12]

10. Nevertheless, global trends in land degradation, soil loss and desertification persist with particular intensity and impact for many lower-income countries and less advantaged groups. They have decreased the livelihoods of smallholder farmers and induced changes in land-use systems leading to a vicious circle of further resource depletion. The stress on the environment and land resources caused by natural disasters and climate-related events, such as droughts, floods, landslides, earthquakes and volcanic eruptions, is an additional burden, especially for the most vulnerable communities. Even more critically, man-made problems, such as deforestation, overgrazing, agricultural mismanagement, industrial contamination and urban sprawl, are a major cause of land loss. And, most tragically, civil strife and wars continue to cause not only the degradation of agricultural lands but also food shortages, malnutrition, famine, internal displacement and refugee situations, and other threats to human health.[13]

11. Increased resources, new solutions and vigorous action in support of rural communities are urgently needed to address the global challenges and overcome the constraints on development faced by the poor, marginalized and disadvantaged, in particular women, indigenous peoples and small farmers. The new relationships forged since the Rio Summit in 1992 among the many stakeholders from government, international organizations, civil society and the private sector constitute the basis for finding joint solutions to these challenges.

II. Selected achievements

A. Sustainable management and use of land resources

12. The focus of Agenda 21 on an integrated approach to the planning and management of land resources has been reflected in subsequent international agreements and in national policy-making. A number of countries have elaborated national policies and procedures for integrated land-use planning and have introduced changes in land administration and land tenure leading to improvements in land resources conservation, management practices and food security. The preparation and implementation of national and regional action programmes to combat desertification have also been undertaken by many countries, particularly developing countries.

B. New agricultural technologies

13. Globally, the adoption of improved production technologies over recent decades has resulted in major food production increases and has averted the mass starvation that was once predicted. Since the United Nations Conference on Environment and Development, total cereal yield increases have more than compensated for the 2 per cent decrease in land under cereals. Unfortunately, many countries, especially in Africa, have not benefited equally in respect of technology adoption and food increases. However, recent improved cassava production in Nigeria and Ghana and the rapid adoption of integrated pest management in various countries, among other successes, demonstrate that African farmers can effectively take advantage of new technologies when given appropriate opportunities. Innovative solutions and tools can be effective for SARD only if they are combined and adapted to specific situations. The choices raise important ethical, social and cultural — as well as technical and environmental — questions for public decision-making.

14. Recent events illustrate the promise and peril of some new agricultural technologies, signalling the threshold of a new age in improving plants for human uses. In 2000, the first complete genetic mapping of a plant was accomplished. The sterile insect technique (SIT) is proving very effective in controlling and even eradicating some pests, inter alia, in more than 15 million hectares of hybrid rice plantings in six Asian countries. On the other hand, each announcement of a new case of "mad cow disease" (bovine spongiform encephalopathy (BSE)) or of cross-fertilization of genetically modified crops with wild species or landraces heightens public concern over the implications of technological advances.

15. With increased consumer awareness largely motivated by health concerns, markets for organically grown crops and livestock and specialist products, such as fruits, vegetables and flowers, have expanded dramatically, offering new opportunities for many farmers in developed countries and some developing countries with good export links. The adoption of new technologies for cereal crops, such as rice in Asia, has often not brought poverty relief to smallholder farmers because of falling commodity prices.

16. In summary, gains have been made, but the technologies required to escape rural poverty are generally not reaching the most needy. In an increasingly competitive world, this means the continued marginalization of the rural poor in many developing countries. To address these problems, initiatives have been launched such as the FAO Special Programme for Food Security (SPFS), which is currently active in two thirds of the low-income, food-deficit countries. Globally, agencies and organizations, including the United Nations University (UNU) and the Consultative Group on International Agricultural Research (CGIAR) increasingly involve resource users in decision-making and as integral research partners in order to address the needs of developing countries and fragile ecosystems more effectively.

C. Governance, decentralization and the role of civil society

17. An emphasis on good governance and collective action at the most appropriate level with all relevant stakeholders has become commonly accepted since the United Nations Conference on Environment and Development. For example, countries have systematically developed National Action Programmes (NAPs) for the implementation of the United Nations Convention to Combat Desertification through a consultative process involving all stakeholders including non-governmental organizations.[14] Similarly, regional and subregional action programmes have been developed for implementation of cross-border issues.

Administrative and financial problems have proved major obstacles to agricultural production, natural resource management and investment worldwide. In extreme cases, the progressive collapse of ineffective systems of governance has culminated in instability, political crisis and conflict-based emergencies for millions of people. Over the last 10 years, civil society and private sector organizations have increasingly been engaged directly in the conception, planning, execution and evaluation of programmes affecting land use and agriculture in collaboration with Governments.

18. Worldwide, more and more farmers' associations, farmers' cooperatives, farm workers' unions, women's organizations and other groups have joined to create umbrella confederations for larger representation and a stronger voice at the national and higher levels. International technical and financial support has assisted in the restructuring and decentralization of rural institutions, capacity-building for local government and farmer organizations and the strengthening of institutional mechanisms for multi-stakeholder dialogue and collaboration. At the local level, strategies, approaches and actions for sustainable agriculture, land and natural resource management and rural development advocated, inter alia, by the non-governmental organization community have contributed to family-scale, knowledge-based, complex agro-ecological systems.

19. During the past 10 years, the trend of participatory processes in agricultural research, extension and community development as well as combating desertification has been positive. The network of National Agricultural Research Systems (NARS) and the Global Forum on Agricultural Research (GFAR) are promoting wider partnerships for developing agricultural research and technology transfer. Programmes in the CGIAR system, including the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), the International Centre for Research in Agroforestry (ICRAF) and the International Institute of Tropical Agriculture (IITA), are applying a similar approach with success. These programmes have sought to improve the efficiency of existing research and development efforts. Increasingly, they are also working with local communities and civil society as full colleagues to achieve their goals.

D. Information and communication tools for improved decision-making

20. Compared with 10 years ago, there is now generally better knowledge and understanding of information on land and water resources, and agricultural and environmental issues as well as wider and more timely dissemination, as a result of the steadily decreasing costs of rapidly evolving modern information technologies and decision-making tools.

21. Examples of environmental information networks include UNEP's Global Resource Information Database (GRID), its Earth Resources Observation Systems (EROS) Data Centre, and the recently launched "UNEP dot Net", an interactive environmental web site. Various satellite observation systems managed by a number of United Nations agencies and national space agencies provide for rapid data analysis. The FAO Global Information and Early Warning System for Food and Agriculture (GIEWS) and Food Insecurity and Vulnerability Information and Mapping System (FIVIMS) provide information on immediate needs as well as the nature of persistent food deficiency and poverty, based on vulnerability analysis and risk assessment, with implications for agricultural productivity, sustainability and rural livelihoods.

22. Progress in implementing integrated land-use and agricultural policies has been constrained in many countries by the lack of sufficient and harmonized information on specific land areas, their location, tenure status and present use and the absence of a reliable land registration system and land administration. Such basic knowledge of multiple land-related factors is important in drawing up and negotiating land-use plans and in monitoring their implementation. The increasing use of geographical information systems (GIS) allows the combined analysis of natural resources and socio-economic information which is proving extremely valuable; however, efforts are needed to improve networking and updating of information at the national and provincial levels.

E. International agreements and mechanisms

23. Since the United Nations Conference on Environment and Development, many international

agreements and instruments have been adopted and programmes of action and projects developed at the international, regional and national levels that address the management of land and SARD from various perspectives.

24. In response to widespread concern that undernutrition still affects over 800 million people worldwide despite substantial increases in food supplies, and emphasizing the urgent need to take immediate action to "achieve food security for present and future generations", Governments at the 1996 World Food Summit in Rome adopted the Rome Declaration on World Food Security and the World Food Summit Plan of Action, with its goal of halving the number of undernourished in the world by 2015. Recent FAO studies have indicated that progress to date in reaching this target is not on track and the goal will not be met unless significant actions and policy changes occur. A five-year review of implementation of the Summit's objectives will take place in November 2001 as part of the biennial Conference of FAO.[15]

25. Governments are currently revising the International Undertaking on Plant Genetic Resources[16] to be in harmony with the Convention on Biological Diversity, which includes arrangements for benefit-sharing, access and ensuring "farmers' rights". In 1996, member countries of the Commission on Genetic Resources for Food and Agriculture adopted both the Global Plan of Action for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture[17] and the *Report on the State of the World's Plant Genetic Resources for Food and Agriculture*.[18] Similar assessments are currently under way for animal genetic resources.

26. Agreements that encourage the international harmonization of food standards include the FAO/WHO Codex Alimentarius, the guide for consumers, food producers and processors, national food control agencies and the international food trade, and the related World Trade Organization Agreement on the Application of Sanitary and Phytosanitary Measures.[19] The depth of concern about the impacts of industry and agriculture on food and the environment is demonstrated by the implementation of Prior Informed Consent procedures for chemicals and the recently concluded negotiations regarding persistent organic pollutants.

27. The International Strategy for Disaster Reduction, created in 2000 as the successor arrangement to the International Decade for Natural Disaster Reduction, is premised on the need to proceed from protection against hazards to the management of risk through the integration of risk reduction techniques into sustainable development.

28. In addition, regional coordination mechanisms as well as financial mechanisms and instruments, such as the Global Environment Facility (GEF) and the Global Mechanism of the Convention to Combat Desertification, have been created for the purpose of facilitating the implementation of the United Nations Conference on Environment and Development related conventions and their programmes of action. Over the last five years or so, the GEF has given increased importance to land degradation in the context of climate change and loss of biodiversity.

III. Issues for further consideration

29. The contradiction of severe poverty and undernourishment in the midst of unparalleled plenty still remains. The loss of land resources and increasing severity and extent of land resource degradation continue in spite of enhanced techniques and knowledge. Our understanding of the mechanisms and factors affecting desertification and drought is still limited. The direct and indirect impacts of technologies and the scale of the global economy have had profound implications for, and some pernicious effects on, sustainable agriculture, land use and fragile ecosystems.

30. The further need for long-term resource management strategies is clear, particularly in most of the low-income, food-deficit countries, in which food shortages and poverty tend to be associated with the unsustainable, extractive use of resources which results in land degradation and desertification; and in higher-income, food-secure countries, land degradation tends to result from the overuse of agricultural inputs, with negative effects on the environment and longer-term economic sustainability. The implementation of Agenda 21, the Convention to Combat Desertification, the Convention on Biological Diversity, the International Strategy for Disaster Reduction, the World Food Summit Plan of Action and other conventions and decisions adopted by key international conferences can provide new impetus and opportunities

for land resources inventories, evaluation, planning and management activities.

31. Issues for further consideration at the national level include:

(a) Renewal of emphasis on the agricultural sector and especially on rural infrastructure and institutions;

(b) Support, including additional financial resources, for the full implementation of existing international and national regulatory instruments dealing with land management and SARD;

(c) Creation of coordination mechanisms for the continuing interaction of Governments with civil society, including non-governmental organizations, the scientific community, local authorities and the private sector;

(d) Better inter-ministerial harmonization of policies, strategies and programmes for, for example, land use, integrated ecosystem management, SARD and integrated resource management.

32. Issues for further consideration at the international level include:

(a) The harmonization of related international conventions and frameworks and strengthening of their regional and international coordination mechanisms;

(b) A review of the extent to which international legal instruments and mechanisms are being implemented and provision of further assistance, where needed, to countries to implement their commitments to these agreements;

(c) Support to developing countries and other countries requiring it for building their intellectual, institutional and financial capacities for improved land use and SARD;

(d) A shift from a response-oriented approach towards longer-term proactive operations of vulnerability reduction and protection aimed at promoting sustainable development.

Notes

[1] *Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3-14 June 1992*, vol. I, *Resolutions Adopted by the Conference* (United Nations publication, Sales No. E.93.I.8 and corrigendum), resolution 1, annex II.

[2] For further information, see FAO, *The State of Food and Agriculture, 2000* (Rome, 2000) and FAOSTAT databases available at www.fao.org. Also FAO, *The State of Food Insecurity in the World, 2000* (Rome, 2000). See also the report of the Secretary-General on sustainable agriculture and rural development submitted to the eighth session of the Commission on Sustainable Development (E/CN.17/2000/7 and addenda).

[3] See World Bank, *World Development Report 2000/2001: Attacking Poverty* (New York, Oxford University Press, 2000), foreword; for details, see www.worldbank.org/poverty/data/trends/index.htm.

[4] *Report of the World Food Summit (13-17 November 1996), Part one* (Rome, FAO, 1997), appendix, World Food Summit Plan of Action, para. 7, and United Nations Millennium Declaration (General Assembly resolution 55/2), para. 19. "Hunger" and "undernourishment" are often used interchangeably to mean food intake that is insufficient to meet dietary energy requirements continuously. "Food security" is a term used to describe access to the food required for a healthy and productive life; food security is often considered at the household level.

[5] International Fund for Agricultural Development (IFAD), *Drylands: A Call to Action* (Rome, December 1998); and UNEP, *Global Environment Outlook 2000* (Nairobi, UNEP, 1999).

[6] United Nations, *Treaty Series*, vol. 1954, No. 33480.

[7] IFAD, *Rural Poverty Report, 2001: The challenge of Ending Rural Poverty* (New York, Oxford University Press, 2001).

[8] See also decision 8/4 on agriculture adopted by the Commission on Sustainable Development at its eighth session (see *Official Records of the Economic and Social Council, 2000, Supplement No. 9* (E/2000/29), chap. I, sect. B).

[9] See FAO and FAOSTAT references in note 2 above, and also UNDP, UNEP, World Bank and World Resources Institute, *World Resources 2000-2001: People and Ecosystems: The Fraying Web of Life* (Washington, D.C., 2000).

[10] FCCC/CP/1997/7/Add.1, decision 1/CP.3, annex.

[11] United Nations, *Treaty Series*, vol. 1771, No. 30822.

[12] See United Nations Environment Programme, *Convention on Biological Diversity* (Environmental Law and Institution Programme Activity Centre), June 1992.

[13] A recent report by FAO estimates that some 60 million people in 33 countries are currently facing food emergencies of varying intensity caused by civil strife and/or weather-related disasters. See FAO, Foodcrops and Shortages (Rome, 2001), available at

http://www.fao.org/WAICENT/faoinfo/economic/giews/english/fs/fstoc.htm

[14] Currently, there are over 170 reports on the implementation of the United Nations Convention to Combat Desertification prepared by the parties to the Convention. The Ad Hoc Working Group, established by the Conference of the Parties to the Convention at its fourth session will meet from 19 March to 6 April 2001 to carry out an in-depth review and analysis of the reports and identify: (a) best practices and successes in implementing the Convention; (b) main difficulties, obstacles and challenges in implementing the Convention; (c) level of participation of all actors, including financial and technical support from developed countries, in the implementation process; and (d) linkages and synergies with other conventions on the environment and development.

[15] See Rome Declaration on World Food Security (*Report of the World Food Summit (13-17 November 1996), Part one* (Rome, FAO, 1997), appendix), para. 6; and note 4 above.

[16] Adopted by the FAO Conference at its twenty-second session, Rome 1983, in resolution 8/83. The undertaking is contained in the annex thereto. Text available at ftp://ext-ftp.fao.org/waicent/pub/cgrfa8/res/C8-83E.pdf. Accessed on 9 April 2001.

[17] *Report of the International Technical Conference on Plant Genetic Resources, Leipzig, Germany, 17-23 June 1996* (FAO, ITCPGR/96/REP), annex 2.

[18] Rome, FAO, 1997.

[19] See *Legal Instruments Embodying the Results of the Uruguay Round of Multilateral Trade Negotiations, done at Marrakech on 15 April 1994* (GATT secretariat publication, Sales No. GATT/1994-7).